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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/522,808	03/10/2000	David A. Molyneaux	MRI-100	5722

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EXAMINER

FETZNER, TIFFANY A

ART UNIT PAPER NUMBER

2862

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/522,808

Applicant(s)  
Molyneaux et al.,

Examiner  
Tiffany Fetzner

Art Unit  
2862



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jun 28, 2002
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17, 25, 26, 36-41, and 45 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 25, 26, 36-41, and 45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Mar 10, 2000 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on Jun 11, 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 9, 11 6) ☐ Other:

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**DETAILED Final ACTION**

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

***2. Election/Restriction***

3. As per the June 28th 2002 amendment response **an election has been made without traverse** to prosecute the invention of an MR coil configuration comprising a pair of coils and a single coil, **claims 1-17, 25, 26, 36-41, and 45**; which correspond to **Figures 1 through 6 and Figure 13**.

4. **Claims 18-24, 27-35, and 42-44**; are **canceled** as per the June 28th 2002 amendment response

***Drawings***

5. The objections to the drawings from the December 6th 2001 office action are **rescinded** in view of applicant's June 28th 2002 amendment response, which successfully overcomes the amendments without adding new matter.

6. The red-ink corrections to figures 7 and 13 are approved by the examiner.

**Detailed art rejections of claims elected without traverse**

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7. **Claims 1-17, 25, 26, 36-41, and 45**; which correspond to **Figures 1 through 6 and Figure 13** of applicant's original disclosure were **elected without traverse** by applicant on Nov. 21st 2001 via the telephone interview with applicant's attorney **James S. Parker** Reg. No. 40,119.

8. ***Response to Arguments***

9. Applicant's arguments in the June 28th 2002 amendment with respect to **claims 1-17, 25, 26, 36-41 and 45** have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 1-17, 25, 26, 36-41 and 45** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Boskamp**, US patent 5,594,337 issued 14th January 1997 filed 20 October 1994.

The rejections below are made **final** in view of the amendments made to applicant's independent claims in the June 28th 2002 amendment response.

12. With respect to **Amended Claim 1, and corresponding Amended method claim 41**, **Boskamp**, teaches and shows an MR pelvic coil configuration for receiving MR signals from the pelvic and leg areas of a patient. The **Boskamp**, reference specifically teaches and suggests "A coil configuration for a magnetic resonance imaging system, comprising: a pair of coils in an opposite rotation orientation associated with a first magnetic field in a region of interest;" [See

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Figure 5, col. 8 lines 24-58; col. 9 lines 56-62; Figure 2; col. 10 lines 8-20; col. 12 lines 47-52; col. 14 lines 3-28 with Figures 19 through 21; In Figure 5 outer coil group 36 includes two generally rectangular loops 40 and 42 within a vertical plane and have coincident axes of symmetry normal to those plane. The current flows clockwise through loop 40 and counter-clockwise through loop 42; and each rectangular loop 40 and 42 is sensitive to changes in the transverse magnetization component of the NMR signal, and the region of interest is the pelvic and legs of a patient undergoing an MRI scan.] **Boskamp**, also teaches and shows “wherein the first magnetic field and the second magnetic field are” substantially (i.e. claim 1) / essentially (i.e. claim 41) “parallel in the region of interest.” [See Figure 5, col. 8 lines 24-58; because in Figure 5 outer coil group 36 includes two generally rectangular loops 40 and 42 within a vertical plane and have coincident axes of symmetry normal to those plane. Additionally, each rectangular loop 40 and 42 is sensitive to changes in the transverse magnetization component of the NMR signal.] **Boskamp**, teaches and shows an additional “single coil (i.e. coil loop coil 38) “associated with a second magnetic field in the region of interest, [See col. 8 lines 29-63; col. 9 lines 56-62] **Boskamp**, also suggests “the single coil is positioned at an essentially zero-flux contour with respect to the first magnetic field” because **Boskamp** teaches that “There will be no sensitivity near a plane midway between loops 40 and 42 where the equal but opposite polarity of the loops 40 and 42 will result in a cancellation of the induced current flow.” [See col. 8 lines 39-42]

13. With respect to **Claim 2**, **Boskamp**, teaches “a means for utilizing the pair of coils for detecting the first magnetic field; and a means for utilizing the single coil for detecting the second magnetic field”, [See col. 8 line 24 through col. 9 line 3; col. 9 lines 55-62; and col. 13 line 60

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through col 14 line 11; Figures 19, 20, 21, 22, 5, and 2]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 2**.

14. With respect to **Claim 3, Boskamp**, teaches and shows “a means for utilizing the pair of coils for generating the first magnetic field (i.e. loops 40 and 42 which comprise coil pair 36, ) and a means for utilizing the single coil (i.e. loop coil 38) for generating the second magnetic field.” [See Figure 5, col. 8 line 24 through col. 9 line 3; col. 9 lines 55-62; and col. 13 line 60 through col 14 line 11; and Figures 19, 20, 21, 22, and 2]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 3**.

15. With respect to **Claim 4, Boskamp**, teaches “a means for utilizing the pair of coils for generating the first magnetic field”; (i.e. loops 40 and 42 which comprise coil pair 36, ) “and a means for utilizing the single coil (i.e. loop coil 38) for generating the second magnetic field.” [See Figure 5, col. 8 line 24 through col. 9 line 3; col. 9 lines 55-62; and col. 13 line 60 through col 14 line 11; and Figures 19, 20, 21, 22, and 2]. The same reasons for rejection, that apply to **claims 1, 2** also apply to **claim 4**.

16. With respect to **Claim 5, Boskamp**, shows that the coil configuration of “said coils of said pair of coils and said single coil are selected from the group consisting of: a single turn loop, [See Figure 5; col. 8 line 24 through col. 9 line 3; col. 9 lines 55-62; and col. 13 line 60 through col 14 line 11; and Figures 19, 20, 21, 22, and 2], a multi turn solenoid wound as series loops, [See Figures 11, 12; col. 10 lines 18-20; col. 9 line 55 through col. 10 line 48] and a multi turn solenoid wound as parallel loops.” [See Figures 11, 12; col. 10 lines 18-20; col. 9 line 55 through col. 10 line 48]. The examiner notes that both parallel and series multi turn loops are represented

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by Figures 11 and 12. The same reasons for rejection, that apply to **claims 1, 2** also apply to **claim 5**.

17. With respect to **Claim 6, Boskamp**, teaches and shows that “each of said pair of coils” (36 comprising loops 40 and 42) “and said single coil” (i.e. coil 38) “lie in planes parallel to each other, and wherein said essentially zero-flux contour is an essentially zero-flux plane.” [See Figure 5, col. 8 line 24-48] The same reasons for rejection, that apply to **claim 1** also apply to **claim 6**.

18. With respect to **Claim 7, Boskamp**, suggests and shows from the figures that “the region of interest is essentially within a cylinder created by the pair of coils, [See Figures 1, 2, 4, 5, 11, 12, 8, 9, 17, 18; col. 12 lines 53-60. Additionally the fact that the coils are designed to surround the legs of a patient directly suggests a generally cylindrical design] **Boskamp**, teaches and shows that “the pair of coils and the single coil are co-axial.” [See Figure 5 col. 8 line 24-48; and Figure 2] The same reasons for rejection, that apply to **claims 1, 6** also apply to **claim 7**.

19. With respect to **Claim 8 Boskamp**, teaches and suggests that “the single coil is a first channel and the pair of coils is a second channel such that coupling between the first channel and second channel is low.” [See col. 8 line 24 through col. 9 line 63] The same reasons for rejection, that apply to **claims 1, 2** also apply to **claim 8**.

20. With respect to **Claim 9, Boskamp**, suggests that “the coupling between the first channel and second channel is approximately zero.” [See col. 8 line 10 through col. 9 line 62 where the elimination of mutual inductance (i.e. coupling) between adjacent coils is taught.] The same reasons for rejection, that apply to **claims 1, 2, 8** also apply to **claim 9**.

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21. With respect to **Claim 10, Boskamp**, teaches and suggests from the figures that “the zero-flux contour is located between the pair of coils.” [See Figure 5 col. 8 lines 24-47]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 10**.

22. With respect to **Claim 11, Boskamp**, suggests from the figures that “the zero-flux contour is located outside the pair of coils.” [See figures 21 and 22 where the flat coil configuration produces a contour “outside the pair of coils”; col. 14 lines 11-28]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 11**.

23. With respect to **Claim 12, Boskamp**, shows and suggests from figures 21 and 22 that “a second zero-flux contour with respect to the first magnetic field is located outside the pair of coils further comprising a second single coil for generating a third magnetic field in the region of interest, wherein the second single coil” is positioned at the second zero-flux contour with respect to the first magnetic field”, [See Figures 21, 22, col. 14 lines 11-33 and Figure 18 which shows a plurality of coil pairs and single coils, and suggest a plurality of zero-flux contours]. As mentioned in the rejection of **claim 1**, all the coils are positioned to minimize coupling therefore the presence of the additional single loop coils in figures 2, 9, 15, 18, 21 and 22 suggest that these coil configurations comprise at least an additional (i.e. a second) zero magnetic flux contour. The same reasons for rejection, that apply to **claims 1, 10** also apply to **claim 12**.

24. With respect to **Claim 13, Boskamp**, teaches, suggests and shows that “the single coil (i.e. loop coil 38) is positioned approximately equidistance from each of the pair of coils.” [See Figures 5, col. 8 lines 39-48] The same reasons for rejection, that apply to **claims 1, 10** also apply to **claim 13**.



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25. With respect to **Claim 14, Boskamp**, suggests from figure 2 that it is possible for “the single coil” to be “positioned closer to one of the coils of the pair of coils than to the other.” [See Figure 2. Additionally, in col. 14 lines 43-57 **Boskamp**, teaches the ability to accommodate some degree of misalignment between the coils (i.e. the single coil may be “positioned closer to one of the coils of the pair of coils than to the other”) in order to accommodate the floating structure of the base and cover providing superior access to the patient.] Therefore, modifying the location of the single coil within the coil pair is within the scope of the teachings taught by **Boskamp**. The same reasons for rejection, that apply to **claims 1, 10** also apply to **claim 14**.

26. With respect to **Claim 15, Boskamp**, suggests and shows that “at least one Helmholtz coil pair associated with a third magnetic field essentially orthogonal to the first and second magnetic fields in the region of interest”, [See Figures 2, 15, 16, and col. 7 line 34 through col. 9 line 62. The Helmholtz coil pair is taught specifically in col. 7 lines 51-57 where connected loops 37 in Figure 15 form a Helmholtz coil pair. Additionally, the Helmholtz coils of Figure 15 are orthogonal to the coils of Figure 5. The same reasons for rejection, that apply to **claims 1**, also apply to **claim 15**.

27. With respect to **Claim 16, Boskamp**, shows “a means for utilizing said at least one Helmholtz coil pair for generating the third magnetic field.” [See the geometrical orientation, and location of Helmholtz pair 37 in Figure 15, with Figures 2 and 5. Figure 2 suggests that figures 15 and 5 are combinable in an arrangement similar to components 37, 41, and 35 in Figure 2.]. It is the examiner’s position that the position and orientation of the Helmholtz coils 37 in Figure 15, when energized in the course of executing the MRI imaging sequence, generates a third magnetic

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field, (interpreted as a z-axis magnetic field), orthogonal to the magnetic field produced by coil pair 36, and single coil 38 shown in Figure 5. The examiner is considering figures 15, 5, 2 and 1 in combination with one another. The same reasons for rejection, that apply to **claims 1, 15** also apply to **claim 16**.

28. With respect to **Claim 17, Boskamp**, shows that the “Helmholtz coil pair is of a configuration selected from the group consisting of: large loops, [See Figures 15] “top/bottom loops”, [See Figure 15, 16] and a combination thereof.”[See Figures 15, 5, 2, 16,] The same reasons for rejection, that apply to **claims 1, 15** also apply to **claim 17**.

29. With respect to **Claim 25, Boskamp** lacks directly teaching that the “pairs of coils are connected together by a pair of electrical conductors to form an Alderman-Grant coil pair.”

However, **Boskamp** teaches that the “pairs of coils are connected together by a pair of electrical conductors” [See col. 8 lines 24-43 and figure 5] therefore, the **Boskamp** reference teaches a coil configuration that suggests the definition of an Alderman-Grant coil pair, and therefore the use of an Alderman-Grant coil pair, is suggested by and found within the scope of the **Boskamp**

reference’s teachings. The same reasons for rejection, that apply to **claim 1** also apply to **claim 25**.

30. With respect to **Claim 26, Boskamp** teaches and shows “a switching means (i.e. switch component 50) [See Figure 6] “for allowing the pair of coils (i.e. 36) and the single coil (i.e. 38) to operate in and switch between **two or more** of the modes in the group consisting of: (I) the coils of the pair of coils and the single coil having currents rotating in the same direction; (ii) the coils of the pair of coils having currents rotating in the same direction, with the single coil

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operating independently; (iii) the coils of the pair of coils having currents rotating in opposite directions, with the single coil operating independently; and (iv) the coils of the pair of coils having currents rotating in the same direction and the single coil having a current rotating in an opposite direction with respect to the currents of the pair of coils.” [See col. 9 line 3 through col. 10 line 29; col. 7 line 34 through col. 9 line 2; col. 13 line 1 through col. 14 line 33; Figures 1 through 14.] The examiner notes that the illustrations of the coil designs suggest that the current flowing through the coils, dependent on the configuration selected, with conduct current in either the same direction (i.e. figure 11, 16, 22) or opposite directions (i.e. Figures 5, 21, and 12). Therefore, each of applicant’s modes is suggested, by the **Boskamp** reference.

31. Additionally, the examiner notes that **Boskamp** reference teaches that the counter-rotating loop coils (i.e. coils which inherently have current flowing in opposite directions) can be utilized. [See col. 13 lines 11-18; col. 8 lines 29-43; col. 10 lines 8-20; col. 13 line 60 through col. 14 line 33] and the double loop coils of Figure 16 with current flowing in the same direction is already conventionally, well-known in the MRI, NMR art. The same reasons for rejection, that apply to **claim 1** also apply to **claim 26**.

32. With respect to **Claim 36**, the **Boskamp** reference suggests “at least one additional pair of coils, [See Figures 9, 18] “wherein said pair of coils in an opposite orientation has odd symmetry with respect to a plane, wherein each of said at least one additional pair of coils is associated with a corresponding at least one additional magnetic field, wherein each of said at least one additional pair of coils has **even** symmetry with respect to the plane and is associated with one of said at least one additional magnetic field such that said single coil is a first channel, said pair of coils in

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an opposite orientation is a second channel”, [See col. 3 lines 35-64; col. 4 line 37 through col. 5 line 6; col. 8 line 10 through col. 10 line 48; col. 12 line 43 through col. 14 line 33] “and each of said at least one additional pair of coils is an additional channel which is orthogonal to the first channel, second channel, and each of the other additional channels.” [See col. 2 line 43 through col. 3 line 24; col. 3 lines 35-64; col. 8 line 10 through col. 10 line 48; col. 12 line 53 through col. 13 line 59; Figures 2, 9, 15, 18;] The examiner notes that a quadrature coil configuration by definition has separate channels per coil, and the teaching of col. 8 line 59 through col. 10 line 30 and col. 4 lines 63-through col. 5 line 2 suggests additional channels for each group of coils from which a signal is received. The symmetry and orthogonality limitations are suggested from the Figures as illustrated, and col. 3 lines 35-60; col. 4 lines 37-through col. 5 line 2. That the additional pair of coils can have an opposite current orientation is suggested from the teachings of col. 14 lines 11-33; col. 13 lines 1-59; Figures 21, 22, 18, 11, and 12. The examiner notes that in the **Boskamp** reference counter rotating loop coils can be used. [col. 13 lines 11-18; col. 8 lines 29-43; col. 10 lines 8-20; col. 13 line 60 through col. 14 line 33] The same reasons for rejection, that apply to **claim 1** also apply to **claim 36**.

33. With respect to **Claim 37**, the **Boskamp** reference suggests “at least one additional pair of coils, wherein said pair of coils in an opposite orientation has odd symmetry with respect to a plane, wherein each of said at least one additional pair of coils is associated with a corresponding at least one additional magnetic field, wherein each of said at least one additional pair of coils has **odd** symmetry with respect to the plane and is associated with one of said at least one additional magnetic field such that said single coil is a first channel, said pair of coils in an opposite

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orientation is a second channel, and each of said at least one additional pair of coils is an additional channel which is orthogonal to the first channel, second channel, and each of the other additional channels”, for the same reasons as those given in the rejection of claim 36, additionally the “odd” symmetry of each of said at least one additional pair of coils is suggested by the fact that the **Boskamp** coil configuration is both inclined and tapering as seen in Figures 1, 2, 3, 4, 13, 14, 17, and the provision for misalignment taught in col. 14 lines 43-49; col. 3 lines 60-64.

Therefore pluralities of coil pairs with their associated single coils are also oddly symmetric with respect to at least one “plane and is associated with one of said at least one additional magnetic field coils”. The same reasons for rejection, that apply to **claims 1, 36** also apply to **claim 37** and need not be reiterated.

34. With respect to **Amended Claim 38, Boskamp**, shows, teaches and suggests “A RF coil configuration for a magnetic resonance imaging system, [See col. 1 lines 10-14] comprising: a plurality of RF coils with bilateral symmetry” [See Figures 2, 5, 11, 12, 9, 15, 16, 18, 19, 20, 21, and 22;], “wherein said plurality of RF coils is associated with a plurality of modes” [See col. 9 line 55 through col. 10 line 25] **Boskamp**, also shows, teaches and suggests the limitation that “the number of modes is less than or equal to the number of RF coils” [See col. 4 lines 41-44; col. 5 lines 53-56; col. 8 lines 29-42; col. 10 lines 8-25; col. 13 lines 11-18; Figures 2, 5, 11, 12, 15, 16, 19, 20, 21, 22]

35. The **Boskamp**, reference also teaches, shows, and suggests that the “plurality of modes correspond with a plurality of current patterns, each of said plurality of current patterns having zero net mutual inductive coupling to each of the other of said plurality of current patterns in a

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region of interest.” [See col. 8 lines 10 through col. 10 line 24; col. 13 lines 11-18; col. 13 line 60 through col. 14 line 28 Figures 2, 5, 11, 12, 16, 18, 19, 20, 21, and 22;] The same reasons for rejection, that apply to **claim 1** also apply to **claim 38**. The examiner considers each coil configuration suggestive of a separate coil pattern, with the arrows suggesting current flow.

36. With respect to **Amended Claim 39, Boskamp**, shows and suggests “a means for utilizing the plurality of RF coils for detecting magnetic fields associated with the plurality of current patterns.” [See col. 8 lines 10 through col. 10 line 24; col. 13 lines 11-18; col. 13 line 60 through col. 14 line 28; Figures 2, 5, 11, 12, 16, 18, 19, 20, 21, and 22;] The same reasons for rejection, that apply to **claims 1, 38** also apply to **claim 39**.

37. With respect to **Amended Claim 40, Boskamp**, shows and suggests “a means for utilizing the plurality of coils for **generating** magnetic fields associated with the plurality of current patterns.” [See Figures 1-14; col. 1 line 11 through col. 3 line 24, col. 4 lines 27-53; col. 8 line 52 through col. 10 line 29] The examiner notes that the MRI device and the NMR antenna means the connects to **Boskamp**,’s coil configuration and generate “magnetic fields associated with the plurality of current patterns” when a patient is being imaged. The same reasons for rejection, that apply to **claims 1, 38** also apply to **claim 40**.

38. With respect to **Claim 45, Boskamp** shows, and suggests “A method of detecting magnetic fields in a magnetic resonance imaging system, comprising the following steps: positioning a plurality of coils with respect to a region of interest such that the plurality of coils support a plurality of modes corresponding to a plurality of current patterns;” [See Figures 1-14; which suggest different coil pattern configurations; and col. 8 lines 10 through col. 10 line 24; col.

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13 lines 11-18; col. 13 line 60 through col. 14 line 28; which suggest the use of multiple modes.

**Boskamp** also teaches, and suggests the step of “detecting the plurality of modes associated with the plurality of coils, wherein the number of coils is greater than or equal to the number of modes, and wherein each of the plurality of current patterns has zero net mutual inductive coupling to each of the other of the plurality of current patterns in a region of interest” for the same reasons given in the rejections of **claims 1, 38, and 39**, of this action that need not be reiterated.

39. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action (i.e. “wherein the first magnetic field and the second magnetic field are” substantially (i.e. **claim 1**) / essentially (i.e. **claim 41**) “parallel in the region of interest.”). Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

40. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

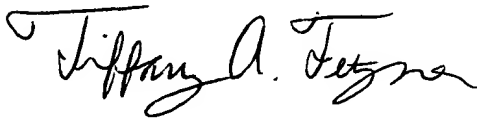
***Conclusion***

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41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is (703) 305-0430. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.


42. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on (703) 305-4816. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3432 .

43. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



TAF

September 6, 2002



EDWARD LEFKOWITZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800